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data sources that were at first text and then evolved into media, i.e. "hypermedia". This even further expanded the use of the Internet or Web. Although many Web pages are professionally designed and, thus, relatively efficient to use, there are still a great many 5 Web pages that are poorly designed and, thus, may present a cumbersome and confusing display interface when presented to the receiving user on the standard Web browser display interfaces, e.g. GUIs (graphical user interfaces). Web browsers that have been available for 10 over a decade as a Web document search and access tool have provided users with the means of bookmarking, i.e. saving the Web path to such documents for future reference. However, such bookmarked Web documents are 15 presented to the receiving user in a standard all-purpose display interface that serves as a default interface. The receiving user may predetermine the values of the attributes that define this interface, and these will serve as the user's standard or default interface. Of course, as the user receives specific Web documents, he 20 is free to change the attribute values from the default values for any specific document display. This is relatively inefficient and time consuming to do Web document by Web document.

On the other hand, the user may need to present different types of regularly accessed, i.e. bookmarked, Web documents in different formats. For example, the user may wish to view a newspaper Web page in a different format from his stock portfolio page or job related technical Web page. Consequently, there is a need to provide Web page users with the means for effectively displaying bookmarked Web documents in different interface formats.

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## Summary of the Present Invention

The present invention provides the user at a receiving Web station with several alternate Web page display interface formats from which the user may select the appropriate format for each Web document that he Thus, each time that a bookmarked Web bookmarks. document will be subsequently displayed, it will have this optimum presentation interface format. invention uses the combination of means for bookmarking a received Web document, means for predetermining at least one display interface format alternate to said standard display interface format for bookmarked Web documents, means for providing a document folder associated with each alternate display interface format, means for enabling a user to put a bookmarked Web document into a document folder associated with an alternate display interface format and means for displaying bookmarked documents in said document folder in said alternate display interface format. The invention may also be set up to permit a user to simultaneously display the plurality of Web documents having the alternate formats in respective separate windows.

The invention also provides for further bookmarking a hyperlink in an already bookmarked Web document in a document folder associated with a particular alternate display interface format to thereby put the Web document accessed through this further bookmarked hyperlink into the document folder associated with the particular alternate display interface format so that this further bookmarked Web document may also be displayed in the same alternate display interface format.

The combination of the present invention may most effectively be implemented through a Web browser at the

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receiving Web station that will include the abovedescribed combination of means for bookmarking a received Web document, means for predetermining at least one display interface format alternate to said standard display interface format for bookmarked Web documents, means for providing a document folder associated with each alternate display interface format, means for enabling a user to put a bookmarked Web document into a document folder associated with an alternate display interface format and means for displaying bookmarked documents in said document folder in said alternate display interface format. Where the invention also provides for further bookmarking a hyperlink in an already bookmarked Web document in a document folder, this further implementation will also be implemented in the Web browser.

The invention may further enable a user to put the same bookmarked Web document into a plurality of folders respectfully associated with a plurality of alternate display interface formats to thereby permit the user the option of displaying the Web document in a plurality of formats as desired.

## Brief Description of the Drawings

The present invention will be better understood and its numerous objects and advantages will become more apparent to those skilled in the art by reference to the following drawings, in conjunction with the accompanying specification, in which:

Fig. 1 is a block diagram of a data processing system including a central processing unit and network connections via a communications adapter that is capable of implementing the receiving display station on which

the received Web page or Web document may be processed by AUS920030309US1 the received web page or web document may be processed in accordance with the present view of a with t narking in accordance with the present invention mail he fig. Portion upon which the present invention may be Fig. 3 is a diagrammatic illustration of a display Fig. 3 is a diagrammatic lillustration of a dief

web document that may be a initial web document invention

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provided and interconnected to various other components by system bus 12. An operating system 41 runs on CPU 10, provides control and is used to coordinate the function of the various components of Fig. 1. Operating system 41 may be one of the commercially available operating 5 systems such as IBM's AIX 6000™ operating system or Microsoft's Windows98 $^{\text{TM}}$  or WindowsNT $^{\text{TM}}$ , as well as UNIX and other IBM AIX operating systems. Application programs 40, controlled by the system, are moved into and out of 10 the main memory Random Access Memory (RAM) 14. programs include the programs of the present invention that will be described hereinafter in combination with any conventional Web browser at the receiving Web station, such as Netscape 3.0™ or Microsoft's Internet 15 Explorer™. The program routines in applications 40 would be the programs involved in the provision of alternate customized display interfaces for bookmarked received Web documents. A Read Only Memory (ROM) 16 is connected to CPU 10 via bus 12 and includes the Basic Input/Output System (BIOS) that controls the basic computer functions. 20 RAM 14, I/O adapter 18 and communications adapter 34 are also interconnected to system bus 12. I/O adapter 18 may be a Small Computer System Interface (SCSI) adapter that communicates with the disk storage device 20. 25 Communications adapter 34 interconnects bus 12 with an outside Internet or Web network. I/O devices are also connected to system bus 12 via user interface adapter 22 and display adapter 36. Keyboard 24 and mouse 26 are all interconnected to bus 12 through user interface adapter It is through such input devices that the user may

interactively relate to the programs for bookmarking and

documents at the receiving display terminal according to

selected alternate display interfaces for bookmarked

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the present invention. Display adapter 36 includes a frame buffer 39 that is a storage device that holds a representation of each pixel on the display screen 38. Images may be stored in frame buffer 39 for display on monitor 38 through various components, such as a digital to analog converter (not shown) and the like. By using the aforementioned I/O devices, a user is capable of inputting information to the system through the keyboard 24 or mouse 26 and receiving output information from the system via display 38.

Before going further into the details of specific embodiments, it will be helpful to understand from a more general perspective the various elements and methods that may be related to the present invention. Since a major aspect of the present invention is directed to documents, such as Web pages, transmitted over networks, an understanding of networks and their operating principles would be helpful. We will not go into great detail in describing the networks to which the present invention is applicable. Reference has also been made to the applicability of the present invention to a global network, such as the Internet or Web. For details on Internet nodes, objects and links, reference is made to the text, Mastering the Internet, G. H. Cady et al., published by Sybex Inc., Alameda, CA, 1996.

The Internet or Web is a global network of a heterogeneous mix of computer technologies and operating systems. Higher level objects are linked to the lower level objects in the hierarchy through a variety of network server computers. These network servers are the key to network distribution, such as the distribution of Web pages and related documentation. In this connection, the term "documents" is used to describe data transmitted

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                                                        Web browsers. A general and comprehensive description of
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                                                 computer structure described with respect to Fig. 1, may
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With this set up, the present invention, which will be described in greater detail with respect to remain was home or so and through so may be carried out we not we have a set up. De described in greater detail with respect to Figs. 3

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display interface versions of illustration of the display web rade 63 Fig. 3 display interface versions of pookmarked web documents.

Web page 63, in Fig. 2.

Web page 64, in Fig. 2.

Web page 65, in Fig. 2. This standard page contains text wed page to in rig. 2. as well as hyperlinks that had hear graphics and images, at disnlaved in a format that had graphics and it is disnlaved in a format that had been documents. u luayes as well as nather that has been set

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display of Web documents. On the other hand, if the user wishes to display the Web page in an alternate format, in the present example, there are two alternate display interface formats that the user may choose, CBF1 or CBF2 (customized bookmarked folders 1 and 2). In the present example, the user has selected CBF2 69. As previously stated, each alternate display interface for a Web document is associated with a folder for which a set of interface format characteristics or properties and their values have already been predetermined, as will hereinafter be described.

Web document into the selected folder and the document would be displayed in the selected CBF folder interface. Of course, the user has the option of creating a new CBF by selecting item 70 in menu 68, Fig. 4. This will result in the interactive group of dialog cascading menus 66 and 49 shown in Fig. 5. Through the selection of items 67, the user may customize the CBF that he is creating to his specifications. In the example shown, the user has selected item 48 from menu 66 that has opened cascading menu 49. Once created, this CBF may be used for all subsequent bookmarked Web documents.

Fig. 6 is a flowchart showing the development of a process according to the present invention for creating and storing alternate display interface versions of user selected received Web pages. Most of the programming functions in the process of Fig. 6 have already been described in general with respect to Figs. 3 through 6. A Web browser is provided at a receiving display station on the Web for accessing Web pages in the conventional manner and loading them at the display station, step 71. The Web pages are conventionally obtained via a Web

server provided by an ISP. The Web browser has the capability of requesting searches from one or more search engines available through the Web. A process is provided to give the Web browser standard bookmarking

capabilities, but, in addition, the browser is enabled to offer to the user the capability of creating and using alternate display interfaces with interface attributes different from the standard display interface provided by the Web browser for displaying the received Web pages or

documents. Thus, step 72, the browser permits the user to predetermine alternate graphical user interface (GUI) formats, e.g. font type and size, colors, language etc. These alternate formats are each respectively embodied in each of a corresponding set of customized bookmark

folders (CBFs), step 73. The user is provided with a function for putting any received bookmarked Web document into any CBF, step 74. The browser has a standard implementation wherein any fetched Web document will be displayed in the standard interface format, step 75, but an alternate routine is provided for getting and displaying a bookmarked Web document put into a CBF in the alternate display interface format associated with

the selected CBF, step 76.

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There is also provision for the user to select to have a plurality of Web documents from the CBFs of alternate formats simultaneously displayed in a plurality of separate windows, step 77.

The running of the process set up in Fig. 6 and described in connection with Figs. 3 through 5 will now be described with respect to the flowchart of Fig. 7. Let us assume that we are in a Web browsing session through the browser. The flowchart represents some steps in a routine that will illustrate the operation of the

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format, step 83. If yes, the document is displayed in a standard

in the Web document's CBF is located,
                                                                                              step 85, and the Web document is displayed in the CBF the incore.
                                                                                         format, and the web document is displayed in the CBF

have a hook marked door in the CBF

a hook marked door in the CBF

etored in the CBF
                                                                                    As set forth hereinabove, the user may a datarmination
                                                                                different formats. Thus, at this point, a determination of the stored in
                                                                          May be made as to whether the document has been stored in than the
                                                                     a different as to whether the document has been stored in her formed hu returning
                                                                 above document display format, step 87.

the hroces to step 87 is performed by returning

above document display format, step 87.

If Yes, then the
                                                             the process to step ay routine as pertormed by returning in the alocated,
                                                        step 85, and the Web and the document's Care of the other
                                       20
                                                    CBF format, step 86.
                                                                      On the other hand, if in step 87, there is no other
                                        alternate format, the user has the option of
                                   Simultaneously displaying several CBF bookmarked arrection or arrection of arrectio
                               Gocuments in their respective formats, step 88.
              25
                           then the several Web documents are displayed
                     Simultaneously in their respective formats in separate

**The several web accuments are also layer

**The seve
                Windows, step 89. Their respective formats in separate

At this point or if the decision in

At this point or if the decision in
           Step 88 had been No. At this point or it the decision in is at an and atan 90. If
      Step & B. And Deen No. a determination may conveniently the nrocease is returned to
  Yes, it is exited. The session is at an ena, step yo.

If No, the process is returned to
initial step 81.
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Although certain preferred embodiments have been shown and described, it will be understood that many changes and modifications may be made therein without departing from the scope and intent of the appended claims.